



Library of The
Saturday
Afternoon Club

CATALOGUE

1145

6238 jw

— OF —

ELECTRIC BATTERIES

And other Electrical Supplies

MANUFACTURED AND SOLD BY THE

PARTZ ELECTRIC BATTERY COMPANY,

1723 Chestnut Street,

PHILADELPHIA, PA.

“The best is the cheapest:”—ours are the
best for the purpose intended,
of any in the market.

1888.

H. C. COOK,
President.

B. F. BABCOCK,
Sec'y and Business Manager.

PARTZ ELECTRIC BATTERY COMPANY.

TERMS.

Individuals unknown to us, should accompany their orders with the Cash, which may be at our risk of loss in transit if sent by Postal Money Order, Express Money Order, or Bank Draft on New York or Philadelphia. If goods are sent *C. O. D.*, we require one-third cash with the order, to guarantee express charges in case goods should be returned not claimed. Firms or individuals giving satisfactory reference may remit any time within thirty days. Special arrangements will be made with dealers of good commercial standing ordering large amounts at one time.

We will pack all goods securely; and require with each order full shipping directions, whether to be sent by freight or express; but when shipped our liability ceases, and goods are at risk of consignee.

INTRODUCTORY.

Inviting your attention to the within pages, the

"PARTZ ELECTRIC BATTERY COMPANY"

asks your intelligent consideration of the fact, that its Batteries are constructed in the most thorough manner, and are the result of the study and experience of one of the best known scientists of the country, A. F. W. Partz, Ph. D., whose electrical experiments and gathered facts have won close attention both in Europe and America.

We claim that for the distinct purpose for which each kind of Battery is intended, they have no equals; and taking into consideration their simplicity and durability, and the fact that each and all can be re-charged an indefinite number of times by any intelligent person at small expense, they are the most economical, as well as most efficient Batteries in the world.

We guarantee all our goods to be exactly as represented; and stand ready at all times to give to inquirers any reasonable information in relation to use of primary Batteries for any special purpose.

We cordially invite the Medical Fraternity to closely examine our Batteries for medical purposes, and compare them with those of other makers, as careful comparison will always result in our favor.

Our Scientific friends who wish a Battery for the laboratory or classroom, will find in our Acid Gravity Batteries, the very best for their especial purpose.

Our Motor Batteries are unrivaled; in fact, for running a Sewing Machine, Light Lathes, Fans, &c., we have the only thoroughly reliable and economical Motor Battery in the world, and earnestly invite attention to the description given in these pages.

Last but not least, all our Batteries are handsomer, better constructed and made of better material than *any others upon the market*. If we cannot sell a good article we will not sell any.

Thankful for the handsome patronage of the past, the

"PARTZ ELECTRIC BATTERY COMPANY,"

with more extended facilities for manufacture, awaits your orders.

A FEW SUGGESTIONS ABOUT BATTERIES.

To be satisfied with your Battery, when you receive it, be sure when you order, to state the work it is to do, unless you are perfectly familiar with the subject of Electricity and Primary Batteries.

Open Circuit Batteries are intended, primarily, for use in ringing bells, burglar alarms, annunciators, etc.

Our Acid Gravity Batteries have a large range of uses, are very constant and powerful, and require slight attention. For experimental work in the laboratory, scientific demonstration, our Acid Gravity, without porous cup, should be ordered. For Electric Clocks, large Signal Bells, Telephones, Igniting Gas, etc., our Acid Gravity, with porous cup, is superior.

For running Sewing Machines, Light Fans, Lathes, etc., we are justified in saying our Motor Battery *has no real competitor, and we challenge all others to a public test.*

In putting up Batteries follow directions. Don't experiment, for we have done all that. See that ends of wires are bright and clean and kept so; that they are fast in the binding posts and connections on top of carbons and zincs are tight, and you will experience no trouble.

Batteries should never be kept in a damp place or subjected to sudden and great changes of temperature. If too cold, action is retarded; if too hot, it is too rapid and there is waste. From 60° to 70° Fahrenheit is the best temperature for good work.

Don't short circuit your Battery; that is, do not allow any metallic substance or conductor to connect your wires, as the elements are at such times being acted upon and waste is the result. If the short circuiting takes place between your Battery and the point where its work is being performed, you will get no result, for ELECTRICITY ALWAYS takes the shortest course to the ground. It never leaps obstructions to go on its way performing man's mission.

ACID GRAVITY BATTERY WITH POROUS CUP

For Electric Clocks, Signal Bells, Telephones, Annunciators,
Igniting Gas, etc.



Dimensions of glass jar: $5\frac{1}{2} \times 7\frac{3}{4} \times 7\frac{1}{4}$ inches.

In this battery the gravity principle is applied to a voltaic apparatus of the Bunsen type with porous clay cups intervening between the excitant and depolarizing liquids. These porous cups, containing the anodes, are to the height of $2\frac{1}{2}$ inches impregnated with paraffine, to prevent wasteful endo-mosis and loss of zinc by local action.

Each cell is to be charged with a solution of either 22 ounces of sulphate of magnesia or 18 ounces of chloride of sodium in $5\frac{1}{2}$ pints of water, about one fifth of which goes into the porous cup and the rest into the outer jar. The glass tubes are then about one-half filled (by means of an iron spoon or small scoop) with "sulpho-chromic salt," a product in which sulphuric acid has been caused to combine with chromic acid in an amorpho-crystalline state, and which is exclusively manufactured by this Company. The salt readily dissolves, covering the carbon cathodes with a dense depolarizing stratum, which is to be maintained, and therewith the energy of the apparatus, by replenishing the tubes to the mentioned height whenever the electric current begins to fail—and only then, in order to prevent useless consumption of material and the forming of chrome-alum. A cell thus rendered active has an electromotive force of about 1.95 volts; its strength of current with a magnesia sulphate solution is 1.2 ampères and with a sodium chloride solution 2 ampères.

The cells need not be emptied, as a rule, oftener than once a year. The carbons should then be rinsed in hot water and the zincs be cleansed with dilute sulphuric acid and re amalgamated.

A battery of this kind will be satisfactorily employed in all cases in which it is desired to produce an electric current of high intensity and moderate quantity with the least number of cells, or in which an open-circuit battery, be it our own or a Leclanché, would prove of insufficient constancy. With regard to convenience as well as to economy it will be found far superior to the Fuller.

Upon a recent test, a cell of this battery was "short circuited" for ten hours, after which it was put to work ringing a bell, which *it did continuously day and night for eight days*, through a resistance of two *ohms*. The life of the battery was then renewed by simply adding a little "Sulpho-Chromic Salt." There is not an owner of a large building employing a number of electric bells or using an electric clock that can afford

to be without these cells, as they require the very least care and can be depended upon at all times.

Mr. W. T. Brown, Electrician, in charge of the Electric plant of the "Pennsylvania Railroad Company," Philadelphia, reports to us that last July he replaced 6 blue stone and 20 Callaud batteries with 9 cells of this battery. That the work required is ringing 300 bells in the general offices, and call-bells at the carpenter shop and stable, 1800 feet away. There are over 200 miles of wire in the circuit. The cells up to this time, March 10th, 1888, have not been recharged, only a little Sulpho-Chromic Salt added at intervals. *He says it is the best battery in existence for this purpose*, and he will take pleasure in showing any caller the cells in action, or write and verify this statement.

The Superintendent of the "DELAWARE AND ATLANTIC TELEPHONE AND TELEGRAPH COMPANY," office 400 Chestnut street, Philadelphia, says he has been using these cells for the past six months, to replace the Leclanché and other cells that would not fill the bill where attempted to be used. In every instance these have fulfilled all requirements. *We have no hesitation in saying that this is the best closed circuit battery in the world, the averments of others to the contrary notwithstanding.*

The battery jars are of pressed flint glass, very strong and of perfect shape.

Price per cell, complete, \$3 00.

Sulpho-chromic salt, 2 pounds in glass jar, 75 cents.

Sulphate of magnesia, 5 cents per package.

For price of parts, see page 26.

ACID GRAVITY BATTERY

For Small Electro-Motors, Electro-Plating, Laboratory Work, the Class Room, etc., etc.

POWERFUL, CONSTANT, ECONOMICAL.



Dimension of glass jar: $5\frac{1}{2} \times 7\frac{3}{4} \times 7\frac{1}{4}$ inches.

In this new battery the gravity principle is for the first time applied to a voltaic apparatus of the Bunsen type.

The ordinary Poggendorff battery, with vertical electrodes, porous cups and "electropon fluid" is a constant source of inconvenience because of the gradual diffusion of the depolarizing and excitant liquids, the consequent waste of material and weakening

of the electric current, the handling of liquid acid, the forming of chrome-alum upon the carbons and the labor imposed upon the operator of emptying, cleaning and recharging the cells whenever the current falls short of the work it is required to perform.

Our Acid Gravity Battery does not need to be emptied oftener than once in two or three months, and meanwhile its full strength may be maintained by supplying it from time to time with some "sulpho-chromic salt,"* which is exclusively manufactured by this Company. The zincs in this battery suffer so little from local action that they may always be left immersed, unless the apparatus is not to be used for weeks or months, when they may be raised and suspended over the liquid, for which purpose their stems are provided with holes for the insertion of pins above the covers. There is no forming of chrome-alum so long as the sulpho-chromic salt is not supplied greatly in excess of the quantity required.

In putting up a battery of this kind, dissolve 11 ounces of "Sulphate of Magnesia," in $2\frac{1}{2}$ pints of slightly-warm water, or in same amount of water 8 ounces of "Chloride of Sodium" (common table salt). This solution is poured into the glass cell. The glass tubes are then filled (by means of an iron spoon or small scoop) with sulpho-chromic salt up to the level of the liquid, which is a little above the zinc plates. The salt readily dissolves, covering the carbon cathodes with a dense depolarizing stratum, which is to be maintained, and therewith the energy of the apparatus, by replenishing the tubes to nearly the same height whenever the electric current begins to fail. To the alkaline solutions may be added from 5 to 10 per cent. of hydrochloric acid, which lessens the internal resistance, but causes some local action on the zincs. With every battery sent out we furnish very plain and explicit instructions for charging it, and its further maintenance.

The electro-motive force of a cell is about 1.95 volts. Its strength of current is :

	with a solution of sulphate of magnesia	3 ampères
"	"	chloride of sodium
"	"	5.5 "

An addition of 10 per cent. of hydrochloric acid increases the strength of current of a cell :

	with a solution of sulphate of magnesia	to 5.25 ampères
"	"	chloride of sodium
"	"	6.6 "

When it is found expedient to supply the cells with a fresh alkaline solution, the carbons should be rinsed in hot water. The zincs should be cleansed with dilute sulphuric acid and re-amalgamated twice or thrice a year. From the principle on which this battery is based, it will be apparent that it must be left as much as possible undisturbed.

The application of the Acid Gravity Battery to electro-magnetic dental mallets has proven so satisfactory it has actually given a new stimulus to the use of those instruments. Its efficiency and great convenience render the battery also eminently suited for electro-plating by jewelers, watchmakers and amateurs, and there is no voltaic apparatus better adapted to the wants of a chemical or physical laboratory.

As the sulpho-chromic salt is employed in such a manner that it can be completely utilized, this battery is much more economical than any of those that are charged with a chromic solution, which has to be thrown away when only partially exhausted.

*Though principally intended for our Acid Gravity Battery, the "sulpho-chromic salt," containing the essential ingredients of a good "electropoion fluid," may also be used in preparing the customary solutions for Poggendorff and Grenet batteries. In this case one pound of the salt is, according to the desired strength of the liquid, to be dissolved in from $2\frac{1}{4}$ to 5 pints of warm water. The solution will be improved, mainly with regard to constancy of current, by adding to it from 10 to 20 per cent. of hydrochloric acid.

The battery jars are of pressed flint glass, very strong, and of perfect shape.

Price of single cell, complete,	\$3 50
Price of set of 4 cells in box of black walnut,	20 00
Price of set of 6 cells in box of black walnut,	30 00

These boxes are neatly finished and provided with handles and outer pole screws.

Sulpho-chromic salt, 2 pounds in jar with screw cap, 75 cents.

This salt being hygroscopic must be preserved against moisture.

Sulphate of magnesia, per pound, 5 cents.

For price of parts see page 26.

OPEN-CIRCUIT BATTERY

For Annunciators, Telephones, Bells, Igniting Gas, Etc.



Dimensions of glass jar: $3\frac{1}{2} \times 3\frac{1}{2} \times 6\frac{1}{2}$ inches.

The proper employment of this battery is for intermittent work, especially on circuits of high resistance. It has the advantage over the Leclanché that, when exhausted, it can be easily restored by the owner, the electrolyte consisting simply of a neutral solution rich in oxygen. The initial electro-motive force of a cell is 1.6 volts, its strength of current 2.8 ampères.

By slotting the carbon cathodes their surface has been largely increased, and by the use of double anodes it has been rendered more fully effective. In consequence thereof, this battery is of exceptional constancy compared with other Open-Circuit Batteries for light work. The cells being almost hermetically closed, there is little if any evaporation and no efflorescence.

SUMMARIZED,

its superiority consists in :

- 1st. An equal and reliable current.
- 2d. Economy in that its elements are more lasting than in other Open-Circuit Batteries.
- 3d. It is closed, and the excitant cannot become charged with dust and dirt.
- 4th. There is no slop, or climbing salts; and last, but not least, it will not require in ordinary work any attention in from 18 months to 2 years; can be quickly recharged at an expense of not exceeding 10 cents, by any intelligent person, and the zincs being the only thing that will wear out, can be replaced for 5 cents each at any time, which makes this in the long run the cheapest battery in existence, and the nearest indestructible.

Bell-hangers and others placing electric alarms in houses or stores, or call-bells between rooms or other buildings, will consult their own interest, if they would please patrons, by using this battery. Two cells only are required on an Automatic Gas Lighter.

We furnish bells, gongs, push buttons, spark coils, wire, etc., etc., as cheaply as other reputable dealers.

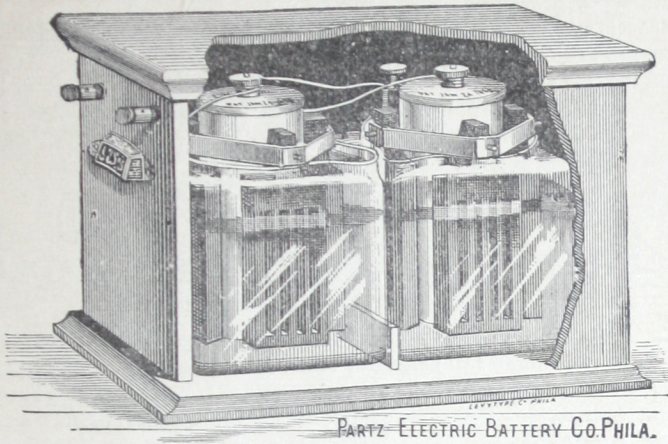
Price per cell, including chemicals for one charge, \$1 00

Ingredients for future use, all ready to be dissolved in warm water, 10

For price of parts, see page 26.

MOTOR BATTERY,

For Running Sewing Machines, Fans, Small Lathes, and other Light Machinery.



PARTZ ELECTRIC BATTERY CO. PHILA.

For the Motor Battery which we now offer to the public, we claim that it meets all essential requirements, which are, abundant power, long constancy of current, and convenient management.

Though this Battery was designed chiefly for domestic use, where the question of health generally precedes that of strict economy, its employment has been found profitable even by persons who work at sewing for a living.

Two cells of our Battery will run any ordinary sewing machine. There is no handling of liquid acids. The porous clay cups containing the zinc anodes may be supplied simply with a solution of one part of common salt in five parts of water, but more advantageously with a solution, in the same proportion, of a compound by which the zincs are always kept clean and amalgamated, and which we sell under the name of "Anodic Salt." The electrolyte for the carbon cathodes surrounding the porous cups is obtained, for two cells, by dissolving about three pounds of our "Sulpho-Chromic Salt" in nine pints of water.

The electromotive force of one cell is 2 volts, its strength of current 10 amperes.

A battery in domestic use does not need to be emptied and recharged oftener than once a month, sometimes not oftener than every three months, this being dependent in large measure upon the work performed, and when meanwhile the electric current begins to fail, it is only necessary to add some Sulpho-Chromic Salt. When work is discontinued for the day, the zincs should be taken out of the porous cups.

For regulating the speed of the motor, we furnish a simple rheostat, by the adjustment of which one may sew fast or slowly and maintain a normal speed despite the gradual decrease of the current.

Hitherto a grave objection to batteries in which chromic acid serves as depolarizer has been the crystallization of chrome alum upon the carbons. The use of our "Sulpho-Chromic Salt" entirely obviates that evil.

After careful test of many motors we have adopted the small "C. & C." as the most suitable one for our purpose, in connection with our battery.

PRICE:

Battery of two cells, in well finished stained wood box, with connecting attachments, a C. & C. Motor, and a Speed Regulator (rheostat),	\$25 00
"Sulpho-Chromic Salt," 2 lbs. in glass jars, with screw cap,	75
Anodic Salt, per charge,	05

We make a liberal discount to persons using our batteries where "Sulpho-Chromic Salt" is ordered in considerable quantity.

As about the only portions of the battery that wear out are porous cups and zincs, we always keep a stock on hand which we sell at reasonable prices; and can furnish, at all times, any part of the battery, however trivial.

For price of part, see page 26.

HEALTH AS AFFECTED BY THE TREADLE POWER SEWING MACHINE.

Sewing is one of the things that necessarily must be done.

Civilization means raiment—not only garments enough to cover our nakedness and keep us warm, but handsome clothes, with tucks, flounces, frills, things fancifully stitched, embroidered, or quilted, in fact, gotten up to please the eye and educate the taste as well as to subserve the demand of every-day use.

"Oh! my, what pretty little things and how cunningly made," exclaims the fond mother as she gazed upon the complete outfit in softest of silk, flannel, laces and cotton, that cunning hands have contrived for the comfort and adornment of that tyrant of the household (God bless them all) the baby. But what about the toiling women who have made these beautiful clothes? Have they pursued the labor in comfort and health and taken pleasure in the thought that the articles they have created will carry gladness whither they go? We have to acknowledge that in too many cases these beautiful creations have been worked out in pain; worked out by women in humble tenements or solitary attics, on sewing machines that buzz through the busy hours of day and silent ones of night, humming their unceasing tune though the muscles that give the power are in pain, and the tired body feels as though the treadle could not be moved again. The patient, silent, suffering women, must work because they must live; work perhaps to help support aged parents, or invalid sisters, brothers, or others near and dear, and so they go on day by day, bending over their work, their feet moving to keep the treadle going, until at last, and all too soon, strength ceases and health has flown forever. Most labor becomes after awhile both irksome and tiresome; woman's special labor, running a sewing machine by foot power, becomes not only both irksome and tiresome but positively unhealthful. You, strong man, accustomed to heavy lifting and out-door exercise, just seat yourself at a table with your head thrown forward, your chin nearly upon your breast and remain in this attitude for hours. "Tired," you say, "had rather work hard out of doors where you can exert *all* your muscles, keep erect, or at least have constant change of position?" Certainly, but how much more wearied would you be if occupying the same position you had to keep your feet in constant motion up and down, with steady strain upon muscles of ankle and leg. This is what women do, day in and day out, months even years, and yet men, kind hearted and considerate men, hardly stop to think that these women are working hard, working away, hope, strength, life, by the interminable foot tread of the sewing machine.

Let us consider the woman at work upon the sewing machine; seated on a common

chair, she places her feet upon the treadle, flexed at nearly right angles with her legs, the legs flexed upon the thigh and the thigh upon the body. Her body is slightly bent forward, the head being supported by the muscles in the back of the neck while her whole attention is directed to the work. When the treadle is set in motion, it will be observed that the movement of the feet is that of alternate flexion and extension; the flexor muscles raising the forward part of the foot, as the heel rests upon the pedal; then the extensor muscles depress the toes and elevate the heel, which motions give the machine its impetus, for hour after hour and day after day.

The muscles of the thigh are necessarily in a state of tension; the body is held in position by the muscles of the back and abdomen, producing in the latter such a strain as to compress all the organs of the abdomen and pelvis, kidney and bowels, and impede, or prevent, their normal action.

In respiration the diaphragm cannot descend as it should, while the circulation is from the flexed position of the limbs, obstructed, causing the blood to accumulate in the body and overcrowd the heart and lungs; and to cap it all, the head, which is a pretty, heavy portion of the body, is pulling forward that most sensitive chord, the spinal, affecting in no small degree, the nerves that center at the base of the brain.

Is it any wonder that women who run sewing machines, become pallid, hysterical, nervous, dyspeptic and irritable, and find themselves weighted down after awhile with a whole train of disorders peculiar to the sex?

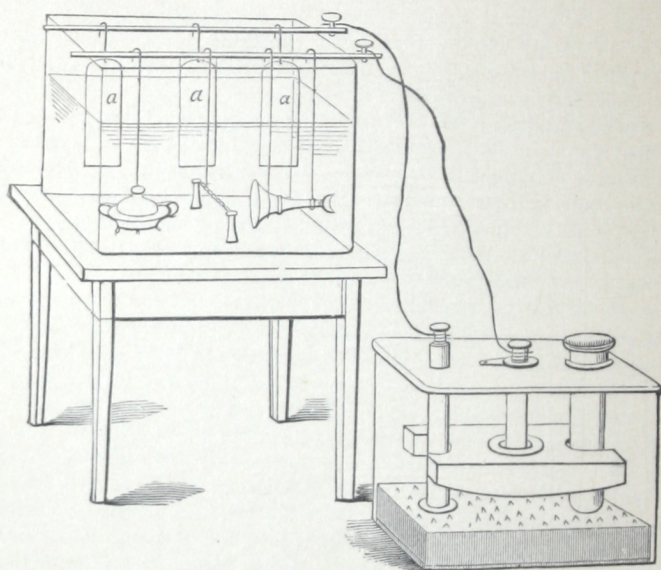
Force a good, hardy, active man to run a sewing machine ten hours, and he will at the end of that time complain of stiffened joints, aching feet and ankles, lame back and neck, and be ready to buy motors or anything else that will run the machine without expenditure of bodily strength. Continue this labor for a number of months and the hale, hearty man will find himself not only *tired*, but constipated, with kidneys diseased, palpitation of the heart, sleeplessness, dyspepsia and ready to declare that life is a burden and future existence under such circumstances a torment.

Women will necessarily have all these symptoms and complaints and others which bring pain, that no man would or could endure. As a well-known physician has said, "ladies who drive the sewing machine treadle, complain of a dull, undecidable pain on top of the head, which seems to remain constant almost day and night, and which is accompanied with an undefinable sense of uneasiness that disturbs the sleep at night and harasses them during the day." "Occasionally there are sensations experienced resembling that of a fright or a feeling imaginary that there is an impending calamity about to befall them. Such sensations are not merely transitory, but last as long as the producing cause is kept up, and even after the cause has been removed the sufferings continue indefinitely unless prompt medical aid is administered." "A second source of suffering and annoyance is that of soreness and pain with occasional swelling on the back part of the neck, at or near the spine, which is occasioned by the constant bending forward of the neck, necessary to keep the body in a proper position to place the feet on the treadle, the physiological effect upon the spine being to gradually separate the spinous processes, giving rise to incessant pains, accompanied with a numbness which is very annoying and oftentimes dangerous." "The thickening of the structures at that point, occasioned by pressure on the spinal cord, gives rise to cramps or a numbness or tingling sensations in the fingers, ultimately resulting in the paralysis of the arms." "The bent portion of the body also compresses the heart between the abdominal viscera and lungs, pains and aches in the back are caused by a continued tension of the lumbar muscles and compression of the kidneys." "The organs contained in the pelvic cavity are all the more or less depressed and displaced downward; the bladder, rectum and uterus are all disturbed and impeded in the performance of their functions, resulting in painful menstruation, leucorrhœa, piles, fistula, etc., which render the female suffering almost beyond endurance."

"The use of the sewing machine is not the sole cause of the above mentioned injuries, together with their attending disagreeable symptoms, but is the most fruitful of all causes. Diseases are not only thus produced but are kept excited and prolonged where they have already existed from other causes." "The most skillful medical treatment when administered under such conditions will only palliate, as such harsh violations of nature's laws will not permit of restoration to health."

"The person who will invent a practical and economic motor for driving the sewing machine will confer as great or even greater blessing on the feminine portion of humanity as the inventor of the sewing machine itself."

ELECTRO-PLATING.



Electro-plating is not so difficult an art or business but that it can be readily understood and acquired by any person of ordinary ability. Of course, patience and practice is prerequisite in order to plate perfectly; and if these qualities are exercised one can in a very short time do as good a job of electro-plating as is desired.

Young men or jewellers in every village of any considerable size, can earn a great deal of money by putting in our batteries and electro-plating outfit.

Of course we would recommend new beginners to read some good text-book upon the subject. Fontaine's *Electrolysis* gives a practical treatise on nickeling, coppering, gilding, silvering, the refining of metals and treatment of ores by means of electricity. Price of this book is \$3.50. We will send it post-paid upon receipt of that sum. There is another book by Urquhart, which is a practical volume, which costs only \$2 00.

Many a man and boy finds pleasure in doing amateur work in this direction; for such we have an amateur's outfit, which costs as follows:

2	Acid Gravity Cells, complete,	.	.	.	.	\$7 00
1	Extra Glass Jar,	.	.	.	.	50
2	Rods, 18 in. long, with connections,	.	.	.	.	1 00
2	Ten-feet conducting wires,	.	.	.	.	20
1	Book of Instructions,	.	.	.	.	1 00
1	Glass Funnel,	.	.	.	.	65
1/2	Pound Quicksilver,	.	.	.	.	40
1	Glass Rod,	.	.	.	.	25
1	Graduated Glass,	.	.	.	.	60
1	Scratch Brush,	.	.	.	.	1 00
1	Sand Brush,	.	.	.	.	45
1	Fine Brush,	.	.	.	.	45
3	Burnishers, assorted,	.	.	.	.	3 00
1	Pound Hanging Wire,	.	.	.	.	60
1	Box Pumice Stone,	.	.	.	.	25
1	Box Whiting,	.	.	.	.	25
1	Box Rouge,	.	.	.	.	50
1	Box Crocus,	.	.	.	.	25
1	Quart Silver Solution,	.	.	.	.	2 50
1	Silver Anode,	.	.	.	.	1 00
1	Jar Sulph-Chromic Salt,	.	.	.	.	75

Total, \$22 60

We send the complete outfit for \$20.00.

We will furnish, upon application, any kind of an outfit, all kinds of solutions, anodes, nickel, silver, copper and gold at lowest prices. Write us just exactly what you want, and we will take pleasure in giving you estimates.

REMEMBER OUR BATTERIES ARE THE ONLY ONES IN THE MARKET, EMPLOYED FOR THIS PURPOSE, THAT GIVE OFF NO POISONOUS FUMES AND EMPLOY NO NITRIC ACID.

NICKEL PLATING.

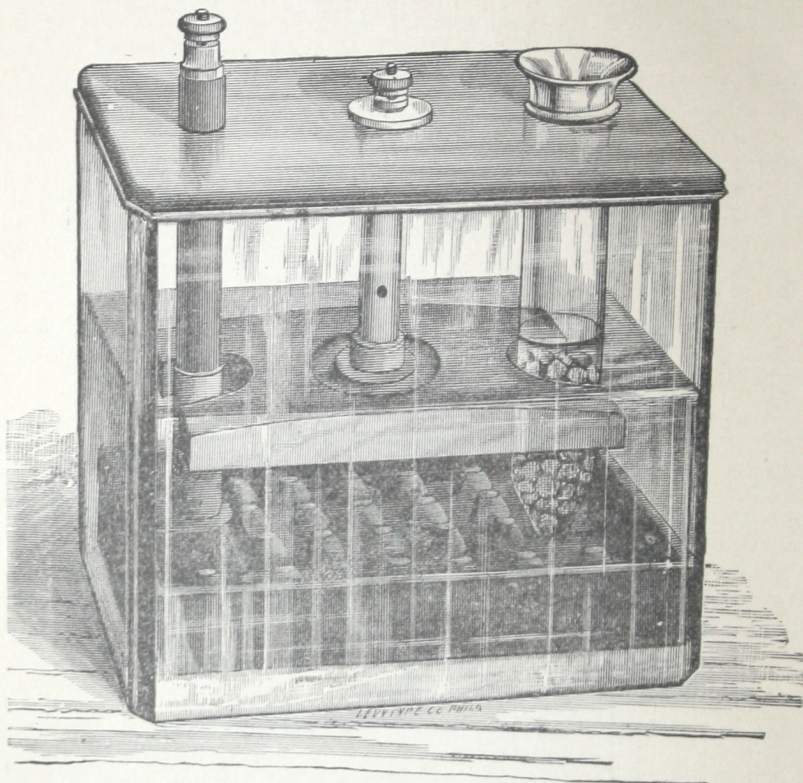
Nickel Plating employs greater battery power than silver plating. The relative cost of silver and nickel plating, unless the latter is done on a large scale, is about alike. Of course, nickel anodes cost less than silver, and if much work is done, the saving is in this direction.

We are often asked the cost of outfits. As a rule, a

20-gallon outfit is worth	.	.	.	.	.	\$50 00
50-gallon outfit,	.	.	.	.	.	100 00
100-gallon outfit,	.	.	.	.	.	200 00

ACID GRAVITY BATTERY FOR ELECTRO-MAGNETIC DENTAL MALLET.

The only Battery that has proven perfectly satisfactory for Dental Work.
Requiring the minimum of care and giving the maximum of efficiency.



In this new battery, to which we invite the attention of dentists, the gravity principle is for the first time applied to a voltaic apparatus of the Bunsen type.

Batteries with porous cups and "electropoion fluid" are a constant source of inconvenience because of the gradual diffusion of the depolarizing and excitant liquids, the consequent waste of material and weakening of the electric current, the handling of liquid acids, and, above all, the labor imposed upon the operator of emptying, cleaning and recharging the cells whenever the current falls short of the work it is required to perform. Moreover, the carbons are generally found incrustated with chrome-alum which reduces their effective surface and is difficult to remove.

Our Acid Gravity Battery does not need to be emptied oftener than once in three or four months, and meanwhile its full strength may be maintained by supplying it from time to time with some "sulpho-chromic salt," a product in which sulphuric acid has been caused to combine with chromic acid in an amorpho-crystalline state, and which is exclusively manufactured by this Company. The zincs in this battery suffer so little from local action that they may always be left immersed, unless the apparatus is not to

be used for weeks or months, when they may be raised and suspended over the liquid, for which purpose their stems are provided with holes for the insertion of pins above the covers. There is no forming of chrome-alum so long as the sulpho-chromic salt is not supplied greatly in excess of the quantity required.

In putting up a battery of this kind each cell is to be charged with about 45 fluid ounces of a solution of 11 ounces of sulphate of magnesia in $2\frac{1}{2}$ pints of water. The glass tubes are then filled (by means of an iron spoon or small scoop) with sulpho-chromic salt up to the level of the liquid, which is a little above the zinc plates. The salt readily dissolves, covering the carbon cathodes with a dense depolarizing stratum, which is to be maintained, and therewith the energy of the apparatus, by replenishing the tubes to nearly the same height whenever the electric current begins to fail, usually about once every week or ten days.

The electromotive force of a cell charged as stated is 1.95 volts; its strength of current 3 ampères.

Four such cells are generally found sufficient for operating a dental mallet, though occasionally a stronger current is desired and five or six cells are employed. The consumption of sulpho-chromic salt by four cells in daily use is from 1 to 2 pounds per month.

When it is found expedient to supply the cells with a fresh solution of sulphate of magnesia, the carbons should be rinsed in hot water. The zincs should be cleansed with dilute sulphuric acid and re-amalgamated twice or thrice a year. From the principle on which this battery is based, it will be apparent that it must be left as much as possible undisturbed.

Price of single cell, complete,	\$3 50
Price of set of 4 cells in box of black walnut,	20 00
Price of set of 6 cells in box of black walnut,	30 00

These boxes are neatly finished and provided with handles and outer pole screws.

Sulpho-chromic salt, 2 pounds in jar with screw cap, 75 cents.

This salt being hygroscopic must be preserved against moisture.

Sulphate of magnesia, per charge, in boxes, 5 cents.

For price of parts, see page 26.

We append a few of the letters we have received regarding the merits of this battery.

Alton, Ill., March 11, 1887.

PARTZ ELECTRIC BATTERY COMPANY

DEAR SIRS:

In answer to your letter of inquiry, I will say that I have had one of your batteries in use since December, 1885. I find that in my practice the main solution will last from three to four months with a good working current, and I use my mallet constantly.

The last charge ran from November 1st, '86, to March 1st, '87, with a consumption of 4 lbs. of sulphate of magnesia, about $3\frac{1}{2}$ lbs. of sulpho-chromic salt and 8 ozs. of zinc.

With an experience of over fifteen years in the use of different batteries and the examination of many others, I have to say that if there is a better battery than the "Partz" or one half so good for our purpose, I have not seen it. It gives the maximum of service with the minimum of attention.

Although the electric mallet had been my faithful assistant for fifteen years, I had about decided to abandon its use, on account of the trouble and nuisance connected with the ordinary battery. The "Partz" has changed all that, and I have no such desire now.

Respectfully,

C. B. ROHLAND, D. D. S.

1513 Walnut Street,
4006 Chestnut Street,
Philadelphia, March 17, 1887.

PARTZ ELECTRIC BATTERY COMPANY,

DEAR SIR:

Of the many batteries I have used and tried for the operating of the electric mallet during the past eighteen years, none have at all equaled your Acid Gravity Battery.

The first one you furnished me, October 27th, 1885, has been in active use ever since, giving me complete satisfaction. A second one has also been in use in my office for fourteen months.

The cardinal virtues of your battery are its constancy and reliability, the little attention necessary, and the freedom from chrome-alum deposit on the carbons. In my opinion it is the best battery for operating the electric mallet.

Yours truly,

S. H. GUILFORD.

1304 Walnut Street,
Philadelphia, March 17, 1887.

PARTZ ELECTRIC BATTERY COMPANY,

DEAR SIR:

I have been using a Partz Acid Gravity Battery for the last ten months with much satisfaction. I have found it much more convenient and reliable, far more cleanly, cheaper and more *satisfactory* than any battery I have ever used.

Very truly yours,

F. D. GARDINER, D. D. S.

Philadelphia, March 18, 1887.

PARTZ ELECTRIC BATTERY COMPANY,

GENTLEMEN:

Your battery has given me so much satisfaction in running my electric mallet that I cannot speak too highly of it. It is certainly no trouble to take care of and can always be depended upon. If it cost double the money I would not be without it.

Yours truly,

GEO. G. MILLIKEN, D. D. S.,
3614 Walnut Street.

Atchison, Kansas, March 8, 1888.

We are still greatly pleased with the Mallet Battery bought of you.

SHULZ & KELLOGG.

The above battery was bought in February, 1887, over one year ago. We could produce hundreds of such testimonials.

FRANK L. BASSETT, D. D. S.,
34 N. 19th Street.

PARTZ ELECTRIC BATTERY CO.


GENTLEMEN:

Philadelphia, March 16th, 1888.

In reply to your inquiry concerning my experience with the "Gravity Battery" for incandescent lighting, would say: I have one of your "Gravity Batteries," of five

(5) cells for running my electric mallet, and besides being entirely satisfactory for that purpose, it is connected by about 200 feet of wire with an Edison lamp rated at two candle power which it illuminates perfectly. The maximum intensity of illumination may be maintained for several hours consecutively, but I have not accurately determined the time.

FRANK L. BASSETT.

 We invite the attention of the dental fraternity to our Motor Battery for running Dental Motors, Lathes, &c., &c.

We guarantee that four cells will do more work than six cells of any other battery in the market, at less expense and without half the trouble of maintenance, and that unless a cell is broken it is practically everlasting, with the exception that zincs must occasionally be replaced.

Since the above was put in type, a number of experiments in relation to running small incandescent lights with the Dental Battery, have been brought to a close, and we are enabled to state that two cells will run a low volt two-candle light, and four cells two two-candle power lights. It is the best battery in existence for running the small mouth lamps used by surgeons and dentists, and our patrons can depend upon it that they can run small lamps more cheaply by this battery than any other in use. We shall keep a stock of low volt lamps, which we will sell as cheaply as can be bought anywhere. It is necessary, in order to get good results, to have lamps that have been specially constructed for primary batteries.

TO THE MEDICAL PROFESSION.

The batteries manufactured by the "Partz Electric Battery Company, are the invention of Prof. A. F. W. Partz, who has given over 30 years to the study of electrical phenomena, and especially the therapeutic effects of currents of electricity.

That, properly applied, such currents do modify or eliminate certain diseases, every intelligent doctor knows. Unfortunately, quacks and charlatans of every degree, men and women, totally ignorant of the anatomical construction of the body, the location of nerves and muscles and their offices, without the trained mind to diagnose disease, have taken Batteries, Voltaic and Faradic, oftenest the latter, and applied the currents therefrom to the physical sufferer, more often to the positive damage of the patient than to his, or her, benefit.

The main thing with these humbugs has been to give a shock, to send a current of electricity through the body that would spasmodically contract the muscles and fill the whole system with a sharp, tingling or burning sensation. The Faradic current may be, and is, the current that a physician posted in electro-therapeutics would employ in a case of paralysis or other disease where it is necessary to arouse the muscles into activity, but the same physician would not apply the Faradic current to the score or more of ills which can be cured or materially helped by the Galvanic current.

Careful, considerate experiments, by scientific physicians, and professors in our Medical Universities, have established the fact, that intense currents, *i. e.*, those that shock the patient and violently contract the muscles are only to be given in rare instances and are beneficial only in a limited range of diseases; and furthermore, that it is unsafe for unskilled hands to apply strong electrical currents to the head; but that it is the steady, mild, constant galvanic current intelligently applied, steadily or at intervals for several minutes, that proves of real benefit in the majority of cases for which electricity is a sovereign remedy.

In fact, electricity, like any other medicine, should be taken under the direction of skilled medical practitioners; and the day has arrived when no practicing physician can afford to be without a thoroughly reliable, voltaic battery.

In giving emphasis to this point, we cannot do better than to quote what Roberts Bartholow, A. M., M. D., LL.D., the eminent physician of Philadelphia, says upon this subject:

"That this force should be utilized in therapeutics, just as any drug is employed as a remedy, is a fact of the highest importance. Besides the addition to the resources of the practitioner thus obtained, it is the one mode by which electricity may be divorced permanently from charlatanry, which has profited by it commercially, whilst it has impaired professional confidence in its utility." "If electricity has real value as a remedy for disease, it is clear no physician is justified on moral grounds in ignoring it, and on commercial grounds, to neglect the employment of so useful an agent, must be regarded as an act of exceeding unwisdom." "To utilize electricity has become a necessity of the times; hence, a full understanding of its principles and appliances is imperative." "The accumulation of clinical facts and experiences, and the improvements in apparatus, have so simplified and facilitated the practical adaptations of the science and art to the work of the physician, that the least qualified members of the profession may achieve a considerable measure of success in practical electro-therapeutics, although unacquainted with the niceties of electrical science."

Physicians who keep abreast of the times do not hesitate in very many disorders to use the battery regularly, until the disease is conquered. It is time that the *Family Physician* began to inform his clientage as to the uses to which electricity may be put, thus putting to flight the advertised nonsense, "Electricity is life," and *ergo*, we cannot get too much of it; but that like Quinine, Belladonna or Bromide of Potassium, or any other acknowledged medical drug, electricity has its uses, and may in the hands of ignorance be abused. Millions of dollars are every year worse than wasted in so-called electric belts, combs, tooth brushes, and other articles, the men who advertise the jim-cracks laughing, meantime, in their sleeves at the gullibility of the public.

We cannot in these pages present to the doctors of the country a treatise upon "Medical Electricity," neither is it necessary to do so. Every publisher of medical books has in his catalogue standard works upon this subject by known scientific practitioners, and the medical journals are almost every issue printing something upon the theme.

Many physicians who possess a fair knowledge of electricity and its medical uses, refrain from availing themselves of its aid in their daily practice, and in defense of this seeming neglect complain that *the voltaic apparatus hitherto employed is too troublesome to maintain and manage*, this being especially the case with the so-called portable batteries. In those which have hitherto been sold, the acid solutions, with which they are commonly charged, enforce the removal of the zinc anodes when the batteries are not in use, and this involves the employment of open cells with the attendant slopping so difficult to prevent, and the carrying of an extra vessel to hold the exciting liquid, or its waste, whenever the physician is compelled to use his battery at the residence of his patients. One physician here in Philadelphia, told us he burned holes in two or three carriage rugs and a nice office carpet with one of the old-time batteries, but that he had used a "Partz Portable" over two years without the least slopping or accident of any kind.

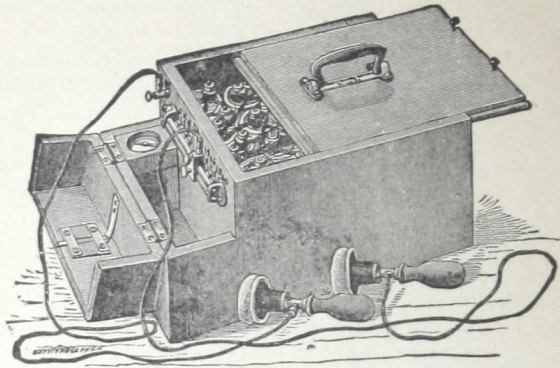
Although acid batteries give an intense current when freshly charged, their strength soon diminishes and the excitant liquid requires frequent renewal; the anodes are rapidly consumed because of the direct action upon them by the acids, and the connections are apt to suffer from corrosion. Besides this, the mechanism of such batteries demands comparatively large boxes for a given number of cells, so that those with cells enough to generate for some length of time a current equal to that of our 20-cell apparatus are practically non-portable.

The medical voltaic batteries manufactured by this Company are entirely free from the objectionable features to which we have referred. When properly used, they remain for a long period in perfect working order without needing any care whatsoever, retaining their energy almost unimpaired. The portable batteries are remarkably compact and easy to carry. There is no handling of acid, no lifting out of zincs, no spilling of liquid. All that the operator has to do, is to attach the pole cords and adjust a slide or switch so as to take into the circuit the number of cells he wishes to apply.

With each battery are furnished special directions setting forth how it is to be charged and used.

PORTABLE BATTERY.

(PATENTED.)



This battery is put up in neatly finished mahogany or black walnut boxes containing sets of 20 voltaic cells which may, by means of a simple adjustment, be applied either together or in such numbers as will give the required minor intensity of current.

The electro-motive force of a single cell is 1.6 volts, according to its measurement by Professor Dolbear, as examiner at the Electrical Exhibition of the Franklin Institute of Philadelphia in 1884. A similar force, it may safely be asserted, has never been obtained from any other voltaic combination containing, like this, neither an acid, a peroxide, nor a per- or acid salt.

The excitant liquid being perfectly neutral, there is of course no direct attack upon the zinc anodes, no "local action," and as the battery is made to hold in a small space a large amount of latent chemical energy, it may be kept in daily use for over a year without anything being done to it; provided that it be not unnecessarily exhausted by "short-circuiting," that is to say, by placing the poles directly in contact or by otherwise closing the circuit without a part of the human body being inserted therein. When finally the battery becomes sensibly weakened, the old solution is to be replaced by a fresh one, the ingredients for which are furnished by the Company.

Each box contains a small galvanometer which constantly indicates the current during its application and by a glance at which an accidental lack of connection is immediately detected. It also contains a pair of conducting cords and pole-terminals, consisting of knobs of moulded carbon covered with chamois, which will be found far more convenient than sponges. The cords are provided with a new kind of tip that can be easily re-attached in case a cord happens to break.

The cells are closed and secured in such a way that a battery in complete working condition is not liable to be injured by being carried in a wagon or railway car. We have sent batteries fully charged to cities as remote as those of Maine and California, where they arrived in good order. It is only when there appears to be special reason for doubt in the safety of their conveyance to distant places that batteries will be sent empty and with them the ingredients for the solution with which they are to be supplied; and as all the wire connections are made at the factory and the cells need not be taken

out of the box in order to be filled, any person of ordinary intelligence, following the concise directions forwarded with each battery, will be able to charge it.

Battery of 20 cells—size of box $7\frac{3}{8} \times 11\frac{1}{2} \times 6\frac{1}{2}$ —weight 16 lbs,	\$35 00
Battery of 30 cells—size of box $9 \times 13 \times 6\frac{1}{2}$,	45 00
Material for recharging 20 cell,	2 00
Material for recharging 30 cell,	3 00

It may yet be remarked that since the fall of 1884 this battery has been severely tested by physicians in almost every State, and proven to be and to do all that is claimed for it. It is the first efficient medical battery that can rightly be called portable and which when exhausted, can be restored to its original force by the owner.

For price of parts, see page 26.

TESTIMONIALS.

Philadelphia, February 23, 1887.

PARTZ ELECTRIC BATTERY COMPANY,

GENTLEMEN :

For many years I have earnestly searched for a Portable Voltaic and a Cautery Battery possessing the advantages which those of your manufacture offer to the medical world. Had you appeared upon the field earlier, the use of Electricity in Medicine would have been far greater and the knowledge of its wonderful efficacy in the treatment of many diseases more generally understood. *We have been hampered in its use by a want of invention, as to the necessity of furnishing an apparatus that a busy practitioner could rely upon ; that did not demand constant attention ; that could be carried with ease and safety ; that was always ready for use and reliable as to quality and quantity. You have given to the profession batteries that cover our needs. For over one year I have been using your Portable Voltaic and a little less than one year your Cautery Battery. After the experience with those made by several other manufacturers during the last ten years, the annoyance over poor mechanism and crude invention, I am once more enthusiastic over electricity as an adjunct to medicine. I send you this testimonial cheerfully and unqualifiedly. You deserve the endorsement of Physicians interested in whatever is the best in medicine and its appliances,*

Gratefully yours,

L. D. JUDD, M. D.,
3603 Powelton Avenue.

Philadelphia, February 24, 1887.

PARTZ ELECTRIC BATTERY COMPANY,

GENTLEMEN :

I used for one month one of the Partz 20-cell Voltaic Batteries and found it entirely satisfactory. I was particularly pleased at the cleanliness of the apparatus and the uniformity of its action.

Yours truly,

J. MADISON TAYLOR, M. D.,
331 South Sixteenth Street.

Philadelphia, July 1, 1887.

PARTZ ELECTRIC BATTERY COMPANY,

GENTLEMEN :—

I have had the Partz Medical Batteries in constant use for the past two years. With considerable experience in the use of such batteries, I am able to say, that it is so much superior to any other make with which I am acquainted, that I can most enthusiastically recommend it and feel that it is destined to give an impetus to the electrical treatment of disease. *I have had one of your Portable Batteries in daily use for 18 months without change of fluid, leakage or repairs, it has never failed to give a satisfactory current during that period of time.* I have also had one of your Cabinet Batteries in daily use for eight months and found it to do excellent service.

Yours truly,

W. C. GOODNO, M. D.,

4003 Chestnut Street.

Philadelphia, July 6, 1886.

PARTZ ELECTRIC BATTERY COMPANY,

GENTLEMEN :—

I have used the Battery over one year, giving it about three hours a week use, and it has not failed at any time in giving me a good current. It has more than fulfilled my expectations.

Yours respectfully,

W. K. INGERSOLL, M. D.,

4008 Chestnut Street.

Philadelphia, July 6, 1886.

PARTZ ELECTRIC BATTERY COMPANY,

GENTLEMEN :—

I have used the Partz Battery for almost two years and have employed it a great deal for a general practitioner. My experience with this battery enables me to say without exaggeration, that its use is not attended with the troubles incident to other portable voltaic batteries, it maintains its constancy for a long period, is easily carried about, does not stop, and finally, gives the user none of the vexation and labor connected with the employment of acid batteries.

Yours, etc.,

C. R. NORTON, M. D.,

700 North Fortieth Street.

*Some Clinical Cases Illustrating the use of the Continued Current, by Prof.
W. C. Goodno, M. D.*

[“Medical Institute,” Phila., February, 1888.]

A. H., aged 29, phthisical habit; while bicycling in New Jersey “got a header,” and injured the right knee. Immediate and great swelling of the joint detained him at Mt. Holly for several weeks: treatment did not avail. He was finally brought home to this city and came under my care. After quiet, bandaging, compression with sponges and bandage, plaster of Paris dressings, and massage with counter-irritation, the knee remained much enlarged, returning to full size after removal of pressure. Medicines did not seem to benefit materially. I was disappointed, but tried galvanism. Applied a current for fifteen minutes from twelve Partz cells, as contained in the portable battery. The swelling was reduced one-half in twenty-four hours. Two more applications at

intervals of twenty-four hours dispersed all exudation; so thoroughly indeed that the knee creaked when flexed and extended. There were no symptoms indicating a recurrence of the affections; but the current was still applied at intervals of a few days as a precautionary measure, followed each time, for several weeks, by creaking of the joint the following day.

J. T., aged 46. Tic-douloureux of left side for six weeks; pain nearly constant and "horrible." Several physicians had failed to accomplish anything. Patient went to Pennsylvania Hospital, although well-to-do, thinking "hospital doctors" might know more of his disease. Received large numbers of drugs, counter-irritants, faradic electric current, etc. Said he had not slept ten consecutive minutes during the six weeks.

First evening.—Applied the current from ten Partz cells for nine minutes, positive electrode to painful points, the negative over the mastoid process. Immediate relief. Slept six hours without waking.

Second evening.—Ten cells twelve minutes. Slept irregularly for five or six hours.

Third evening.—Application ditto. Slept little, but pain moderate. Thinks it due to imprudence in walking in cold wind.

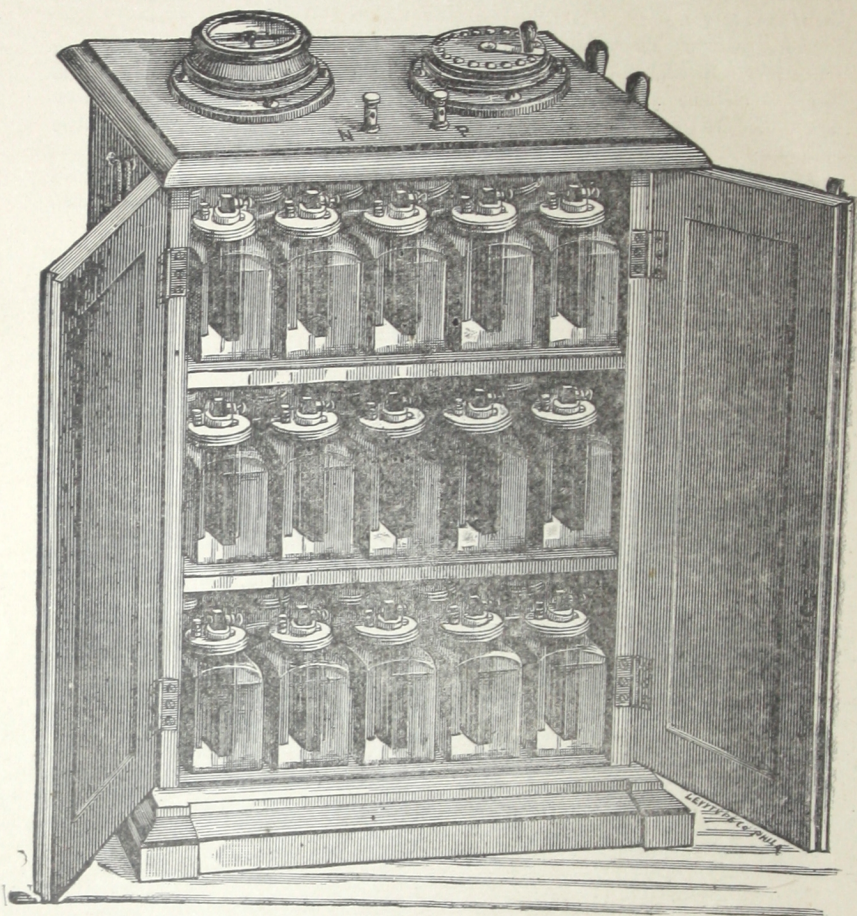
Fourth evening.—Ten cells fifteen minutes. * Slept most of night.

From this time pain was moderate, and I discharged him cured in thirteen days from the beginning of treatment.

Electricity as a therapeutic agent is sadly neglected by the general practitioner. There are many reasons for this. Most important perhaps is the character of the apparatus in use: it is expensive, complicated, troublesome, and rapidly deteriorates. The very prevalent use of the faradic or interrupted current, has yielded such unsatisfactory results that it deserves to be next mentioned; it is a valuable gymnastic, but of little use in painful and exudative disease, which groups furnish large numbers of subjects for electrical treatment. The continuous current is of great importance in neuralgias and persistent inflammatory exudations, whether such exudations are within free cavities or in the meshes of the tissues. A prominent physician said to me lately, "The money paid for my electrical apparatus has been begrudged more than any similar sum I ever expended. It's never in order for many days at a stretch. Something is always wrong. One ought to employ an electrician when he buys a battery. Not satisfied with being out of order the miserable things occasionally burn holes in my office carpet or in my carriage rug if I attempt to carry them." This is the language of a disgusted man. I am happy to state that there is no longer grounds for such statements. The batteries now manufactured by the Partz Electric Battery Company, of Philadelphia, and known as the Partz Batteries, have in my hands been all that could be desired.

CABINET BATTERY.

(PATENTED.)



Dimensions of glass jar : $3\frac{1}{2} \times 3\frac{1}{2} \times 6\frac{1}{2}$ "

The single cell here represented has a slotted carbon cathode between two bars of zinc attached to a metallic cover. The electrolyte with which it is to be supplied is similar to that of the Portable Battery, and so is its electro-motive force. Its initial strength of current is 2.8 amperes.

Because of the carbon cathodes being slotted, whereby their active surface is largely increased, this battery is of exceptional constancy; but as it is intended for circuits of high resistance, it must be used with the same precaution against "short-circuiting" as the Portable Battery. Upon this condition it may be employed daily for a couple of years without its power becoming much lessened, and when it is finally exhausted, it can be easily restored by renewing the solution.

As a battery of this kind for office use must be capable of ready adjustment regarding

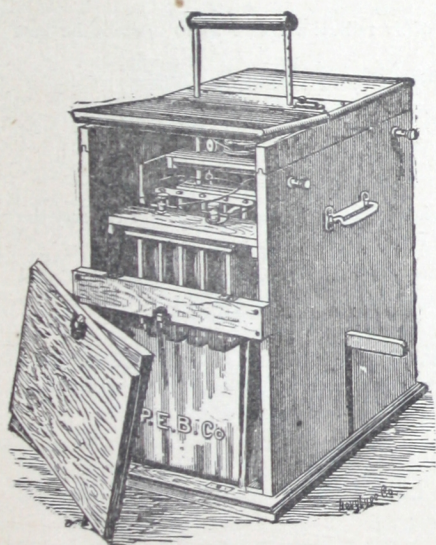
the number of cells that are to be placed in circuit, and as the operator must also be enabled to observe the energy of the current which he is applying, it is necessary that the cells be put up in a certain permanent order and connected with a serial switch and a suitable galvanometer. The Company therefore furnishes sets of 20 and 30 cells (or more to order) in stands of black walnut, 22" long, 12" broad, and 32" high, closed by doors on either side and forming a small cabinet mounted by a galvanometer and a circular switch, as represented here below. For transportation the cells are left empty, and the necessary chemicals sent with them. But the connecting-wires are attached to the switch, the galvanometer is inserted in the circuit, and with the aid of the accompanying directions the whole can be easily arranged and adjusted. It has been deemed judicious to omit all unnecessary contrivances with which medical office batteries are generally encumbered, and which often only serve to confound the operator.

Price of a cabinet of 20 cells, complete,	\$75 00
Price of a cabinet of 30 cells, complete,	85 00

These prices include a pair of carbon poles and of conducting-cords with tips, the same as go with the portable batteries, and the chemicals for one charge.

We shall be happy to give price upon Cabinet Batteries up to 50 cells, the highest number used; with current regulator, which gives current equally from every cell and milliampere metre which shows dosage.

IMPROVED CAUTERY BATTERY.



Acknowledged as the best by every surgeon who has examined or used it.

With this new battery we challenge any and all other Cautery Batteries now in the market to a test.

It has two large cells, each with an effective carbon surface of over 200 square inches, and is equally well adapted to the use of platinum knives and of wire loops.

It may be put into action either by hand or by foot, and after adjusting it for the required strength of current, the operator may leave it and apply his instrument without having to keep one foot on the pedal. The electrode should not be left in the liquid *any longer than is necessary*.

The battery emits no fumes, and no liquid acids are used in charging it; one has only to dissolve from 2 to 3 pounds of our "sulpho-chromic salt" in

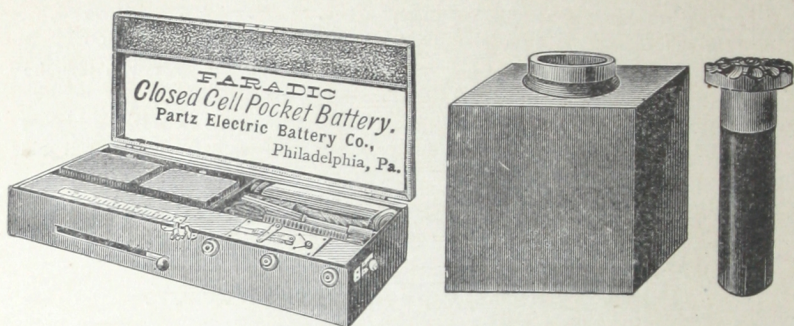
8½ pints of water, and fill each jar up to the horizontal line cut into the glass. As it evaporates add a little water.

All physicians now employing this apparatus speak of it in highly complimentary terms, and we guarantee it to be the easiest managed and in every way the best Cautery

Battery in the world. We will gladly refer intending buyers to eminent surgeons who have our Batteries in use.

Price of battery, with tipped pole-cords, and sulpho-chromic salt for one charge, \$40 00.
Sulpho-chromic salt, in glass jars, two pounds, 75 cents.

CLOSED CELL POCKET BATTERY, FARADIC CURRENT.



This battery combines improvements of so radical a nature as to make it the best Pocket Faradic battery upon the market.

Manufactured in two sizes—

No. 1—6 in. long, $3\frac{1}{2}$ in. wide, and $1\frac{1}{2}$ in. high.

No. 2— $7\frac{1}{8}$ in. long, $3\frac{3}{8}$ in. wide, and $1\frac{1}{2}$ in. high.

These sizes admit of their being easily and comfortably carried in the pocket.

The cells are absolutely air and acid-tight, thus enabling the operator to carry the battery in any position, charged and ready for immediate use.

They have a current so *mild* that it cannot be felt excepting by the most sensitive, and yet be gradually increased to one so *strong* as to fully meet the requirement of any medical demand.

The disagreeable jerk, or electric "thump," so characteristic of many Faradic batteries, is not found in these, but a current that is nowhere excelled for its *fineness*, *smoothness* and *agreeableness*.

The cell will give ten to twelve hours' work, and can be used from day to day, until that much electric energy is consumed upon the *same charge of Bisulphate of Mercury* used to get one hour's work out of a once popular Electric machine, hence there is no question as to the claim of *economical working*.

The *Pole cords* are attached on the *outside of the box*; the *Graduator* is *outside*, most handily placed, and cannot fall out; the "*Cut-off*," for "*making*" and "*breaking*" circuit is *also outside*.

The boxes are Mahogany or Black Morocco.

The *Induction Coil*, of best copper wire, carefully wound and properly proportioned to produce the best effect.

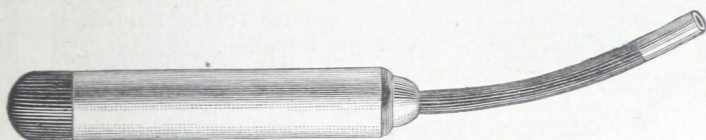
The *Cells* are of hard rubber with carbon chamber, charged with a solution of *Bisulphate Mercury*, into which a zinc rod is immersed. The zinc rod has a rubber head fitting tightly into the neck of the cell, making the whole *air-tight* and *acid-tight*.

Printed directions accompany each battery.

PRICES.

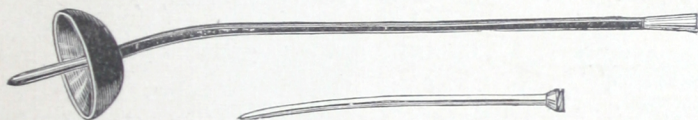
No. 1,	\$7 50	Zinc Rods, with Stopper, . .	\$ 25
No. 2,	10 00	Pole Cords, per pair, . . .	75
Cells each, . . .	1 50	Mercury, per oz., 10c. ; per lb.,	1 25

We take pleasure in presenting to our immediate patrons and the trade this condensed statement of the various Electrodes we manufacture. They have been designed after consultation with some of the oldest and most eminent practitioners in the country, and we trust will meet a long felt want by medical men and others, for first class instruments at a reasonable price.



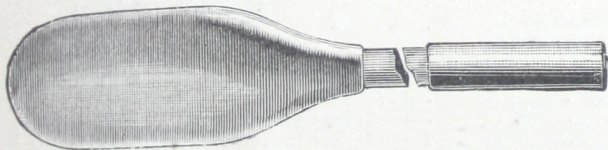
No. 8. VAGINAL ELECTRODE.—hard rubber point and stem, . . . \$2 00

The purpose of the hard rubber point is to protect the os. It is handsomely finished, and of the most approved shape and size,



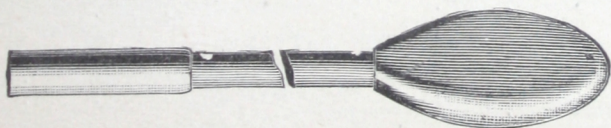
No. 10. ELECTRODE FOR OS, \$2 00

This Electrode is made cup-shaped, especially for treating the os, and cervical canal; two different sizes of points accompany each instrument.



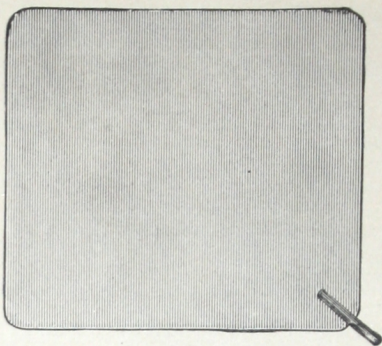
No. 2. ELECTRODE FOR RECTUM, \$1 50

Insulated stem of annealed wire so it can be bent into any desired shape.

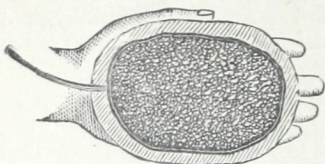


No. 6. ELECTRODE FOR TONGUE, \$1 50

Insulated Stem of Polished hard rubber.



No. 5, METALLIC FOOT PLATE,
 polished, $10\frac{1}{2} \times 9$, . \$ 75
 nickel plated, . . . 1 00
 We also make a folding Foot Plate,
 nickel plated, . . . 1 50



No. 3. SPONGE COVERED ELEC-
 TRODE, . . . \$1 50
 Insulated with soft rubber back for general ap-
 plication with the hand. Has permanent con-
 ducting cord attached.

PRICE OF PARTS.

PORTABLE MEDICAL BATTERY.

Glass cells, with cover, . . .	\$ 20	Tips and cords, . . .	\$1 00
Carbons, . . .	10	Carbon electrodes, each, . . .	1 00
Zincs, . . .	10	Tinsel cord, per foot, . . .	5
Galvanometer, . . .	1 75		

CABINET BATTERY.

Glass cells, each, . . .	\$ 25	Connection for carbon, . . .	\$ 20
Carbons, . . .	25	Connection for zinc, . . .	15
Zincs, each, . . .	5	Ingredients for solution per cell, . . .	10

OPEN CIRCUIT BATTERY.

Glass cell with cap, . . .	\$ 20	Nickel Plated cap, nuts and screws for zincs, complete, . . .	\$ 20
Carbons, . . .	25	Plated Carbon connections, . . .	15
Zincs, each, . . .	5		
Rubber Rings, each, . . .	2		

Discount to the trade.

ACID GRAVITY BATTERY (With Porous Cup).

Cell, . . .	\$ 75	Zinc, . . .	\$ 30
Porous cup, . . .	25	Carbon, . . .	40
Glass tube, . . .	5	Carbon rod, . . .	10

ACID GRAVITY BATTERY (Plain).

Cell, . . .	\$ 75	Carbon, . . .	\$ 50
Zinc, . . .	50	Carbon rod, . . .	10

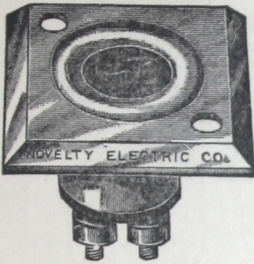
MOTOR BATTERY.

Glass cell, . . .	\$1 00	Porous cup (paraffined), . . .	\$ 25
Zinc, . . .	50	Brass ring, . . .	60
Carbons, each, . . .	30		

CAUTERY BATTERY.

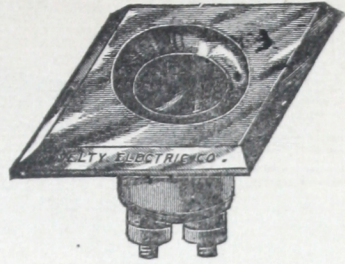
Glass cells, each, . . .	\$1 00	Carbons, each, . . .	\$ 40
Zinc plates, each, . . .	50		

PUSH BUTTONS.



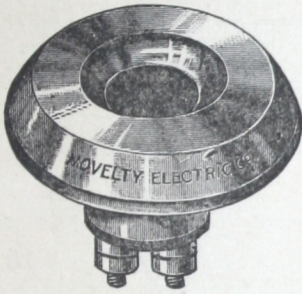
ORNAMENTAL SQUARE.

Brass,	.	.	.	55 cts.
Nickel Plated,	.	.	.	70 cts.



ORNAMENTAL DIAMOND.

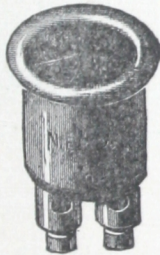
Brass,	.	.	.	60 cts.
Nickel Plated,	.	.	.	75 cts.



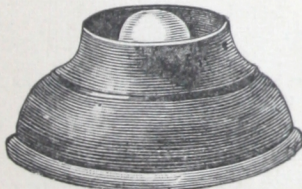
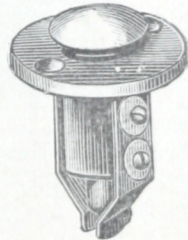
ORNAMENTAL ROUND.

Brass,	.	.	.	.	50 cts.
Nickel Plated,	.	.	.	.	65 cts.

ECONOMY PUSH.
Nickel Plated, . 45 cts.



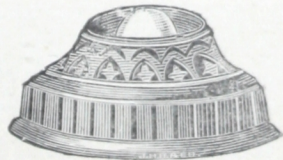
FLOOR PUSH,
Price, . 75 cts.



WOOD ROUND.

Rosewood,	.	.	.	30 cts.
Mahogany,	.	.	.	25 cts.
Black Walnut,	.	.	.	25 cts.

PEAR SHAPED PUSH
BUTTONS,
to be attached to
Electric Bell cord,
75 cents.



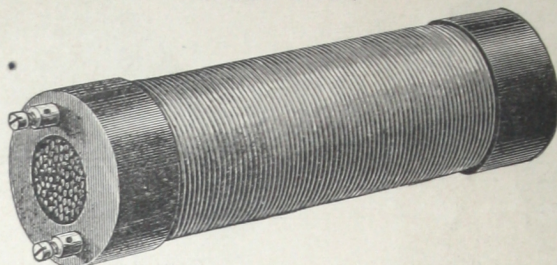
BRONZE.

Fancy,	.	.	.	50 cts.
--------	---	---	---	---------

Porcelain Push Buttons, plain,	.	.	.	.	50 cts.
“ “ “ fancy,	.	.	.	.	30 cts.

ELECTRIC GAS LIGHTING SUPPLIES.

SPARK COILS.

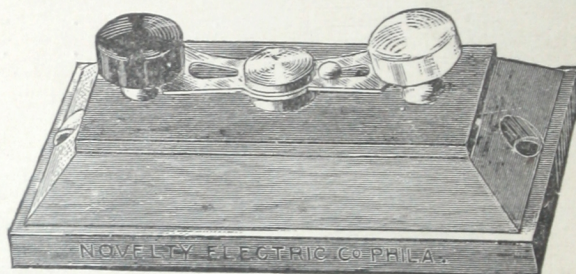


No. 1.

Price, No. 1, 8½ inches long	.	.	.	.	.	.	\$3.00
" " 2, 10 " "	.	.	.	.	.	.	3.50
" " 3, 12 " "	.	.	.	.	.	.	4.50

The smaller coils will be found efficient for ordinary lighting work, while the larger ones are needed for Gasoline, or common coal gas, where the circuits are long. These goods are made by us expressly for our trade, and will be found reliable.

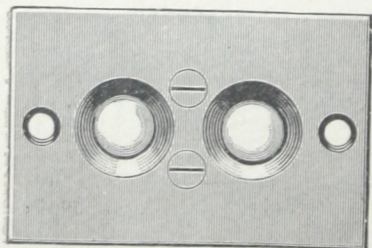
LIGHTING KEYS.



These Press Buttons are of superior quality, manufactured by us with black walnut, ash, oak, or mahogany bases.

Price, 2 Button Key	.	.	.	.	.	.	\$ .75
" 4 " "	.	.	.	.	.	.	1.00
" 6 " "	.	.	.	.	.	.	1.50
" 8 " "	.	.	.	.	.	.	2.00

Larger sizes made to order.

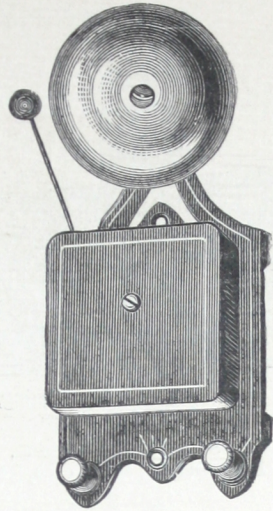


COMPOUND PRESS KEYS.

2 Buttons, Black Walnut Bases,	\$1.00
4 " " " "	1.50
6 " " " "	2.00
8 " " " "	2.50
10 " " " "	3.00

In the manufacture of these bases we use our celebrated Economy Button, and can recommend them as first-class.

Our celebrated Acid Gravity Battery Porous Cell, will, with one cell, run the automatic burner, where a 10 inch coil is used. No other battery in the world will do it.



ENAMELED METAL BOX BELL.

Fine Finish, nickel-plated, strong, reliable, and very handsome in appearance.

Price, 2½ inch Gong,	.	.	\$1.75
" 3 " "	.	.	2.00
" 3½ " "	.	.	2.50
" 4 " "	.	.	3.00

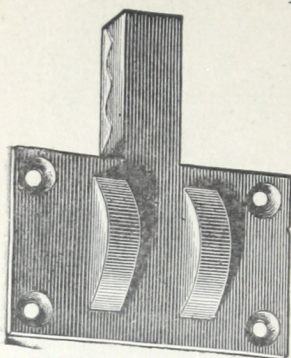
Of our own Design and manufacture, for the use of Invalids, or for any purpose where an Electric Bell is required. Handsomely enclosed in Finished Walnut Box.

Price for Bell, Battery, Pear-shaped Push Button with 25 feet conducting cord, .	\$7.50
Extra Cord, yer yard, . . . . .	.25

A detailed engraving of a circular mechanical component, likely a valve or a cover. It features a central circular opening with a dark, textured interior. The outer ring has four small, rounded protrusions or bolts, two of which are clearly visible at the top. The entire component is rendered with fine horizontal lines, giving it a metallic, textured appearance.

Price, Rosewood and Mahogany, each, 900
 " Black Walnut, Ash or Cherry, " 85

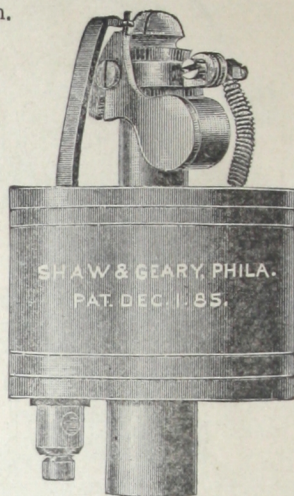
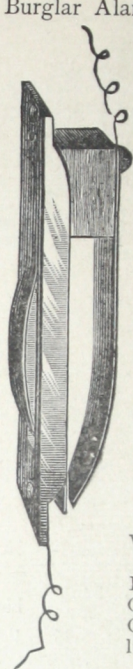
DOOR AND WINDOW CONNECTIONS, &c. For Burglar Alarm.



Double Window Spring,
Price each 50 cts.

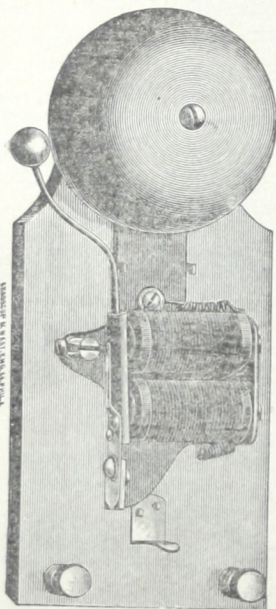
Single Window Spring,
Extra Quality, Price each, 30 cts.

Door Spring,
Price each, 25 cts.



VIBRATORY GASLIGHTERS.

We sell the Shaw & Geary,
Price, . . . \$2.25
Boston Automatic, . . . 5.00
One cell of our Acid Gravity Porous
Cup Battery, with 10 inch coil, will
light these burners.



Single Window Spring,
Price each, 25 cts.

THE SHAW & GEARY NORWAY IRON FRAME BELLS.

From practical experience it has been found that cast-iron Frame Bells become polarized to a certain extent after being in use a short time, thereby causing the movement to become sluggish. The bells become weak from no apparent cause, and additional battery does not remedy the effect.

In our new style Bell only the best Norway iron is used for the cores, armature and frame, and this metal being of a soft nature does not readily retain magnetism.

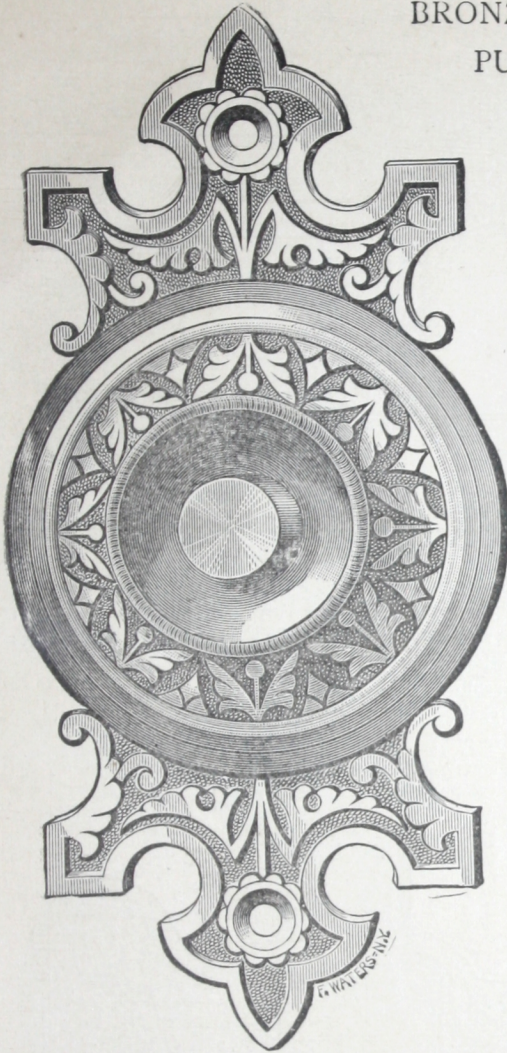
The armature is nickel-plated in order to prevent rusting; the spring is of German silver, and is so constructed that it can be easily adjusted for light or heavy currents. The contact points are made of pure platinum, securely riveted into position. The magnets are carefully wound to $3\frac{1}{4}$ ohms resistance with the best insulated wire. The cases are of black walnut and ash, the wood being filled and polished. The gong and binding-posts are handsomely nickel-plated, the latter being made on the order of the English Binding Post, with long screw, allowing under the head without danger of dropping off. The working parts of our Bell are so adjusted as to give the full, clear tone of the gong, and it will give better satisfaction over a long circuit with less battery power than any bell now on the market with the same resistance. *This fact we are willing to guarantee.*

PRICES: 2½ inch Gong, each, \$1.00; 3 inch Gong, each, \$1.10; 3½ inch Gong, each, \$1.25; 4 inch Gong, each, \$1.50; 5 inch Gong, each, \$1.75; 6 inch Gong, each, \$2.00. Continuous Ringing Attachments for the above, each, 80 cents.

BRONZE FRONT-DOOR PUSH BUTTON.

Price, \$3.00

We can furnish Electric Door Pulls and Push Attachments, all styles, at prices ranging from \$1.50 to \$6.00.



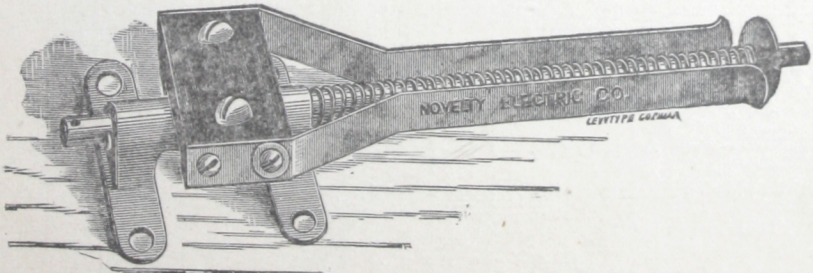
CIRCUIT

CLOSING ATTACHMENTS

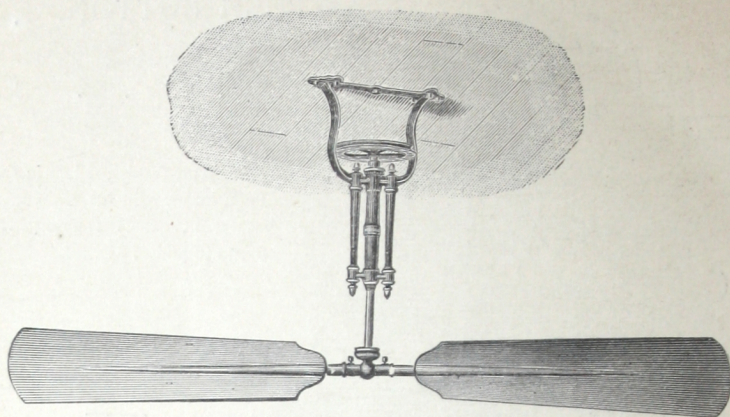
For Mechanical Bell Pulls.

This attachment can be connected with the usual style door pull to ring from one to three electric bells, located in any part of the premises. Can be connected without disturbing the bell pull already in use.

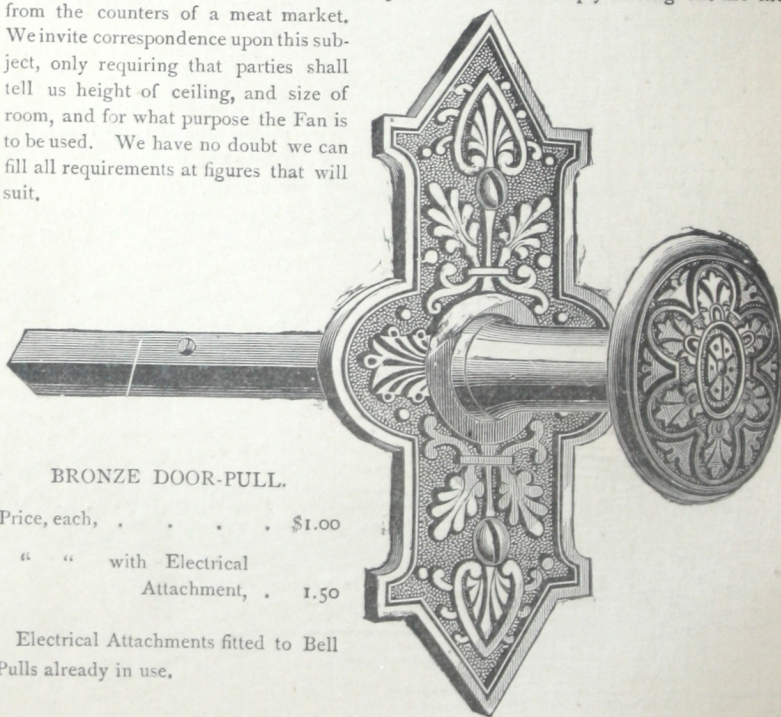
Price, each, 1 connection,	75c.
“ “ 2 “	85c.
“ “ 3 “	95c.



FANS, &c., &c.,



We are prepared to furnish ceiling and upright Fans of all styles, finished with varnished blades and Japanned or small Fans of brass 12 and 18 inches with 6 blades, to work from the shaft of the motor. We can furnish Fans with nickel-plated attachments, or plain as may be desired. We have such a large number of designs it is impossible to illustrate them here. Suffice it to say, we will put up a Fan outfit for the dining room of the best house in the land or one whose province shall be simply driving out the flies from the counters of a meat market. We invite correspondence upon this subject, only requiring that parties shall tell us height of ceiling, and size of room, and for what purpose the Fan is to be used. We have no doubt we can fill all requirements at figures that will suit,



BRONZE DOOR-PULL.

Price, each, . . . \$1.00

" " with Electrical
Attachment, . 1.50

Electrical Attachments fitted to Bell
Pulls already in use,

ELECTRICAL SUPPLIES.

To meet the numerous demands made upon us, we have concluded to keep a supply of the articles enumerated on this and preceding pages, and are prepared to furnish as cheaply as others in the trade all kinds of electrical supplies. We shall be happy at all times to give prices and information. Write for discounts, price list, INCANDESCENT LAMP CORD for Portables, Trackets, Drop Lights, &c., &c.

Conductors composed of Fine Wires Insulated with Rubber and braided in Silk, Worsted, or Cotton.

*Two Conductors Twisted or Flat.
In Different Colors or Combination of Colors.*

Conductor.		Equal in Con-	Silk	Cotton
No.	Wires,	ductivity to	peryd.	peryd.
14	34	22 P. & S. Gauge,	10c.	8c.
10	30	" "	10	8
16	30	" 18	12½	10
25	30	" 16	16	12
40	30	" 14	24	20
60	30	" 12	36	30

Gas Fixture Wire.

For Lighting Gas by Electricity.
White, Yellow or Brown.

Triple Cotton Covered.		Price per lb.
No. 18 B. & S. Gauge		\$.45
" 22 "		.90
" 24 "		1.00
" 26 "		1.30

Discount..... per cent.

In response to a growing demand for a better insulation, we now offer a fixture wire with quadruple winding, the inner wrap being of silk, the three outer of cotton, finished in usual colors.

Quadruple Covered, Silk-Inside.

No. 18 B. & S. Gauge,	\$6.65
" 22 "	1.10
" 24 "	1.20
" 26 "	1.57

Discount per cent.

Flexible Speaking Tube.

Spiral Wire Foundation, covered with Rubber and neatly finished on the outside with Silk or Worsted in any color.

Price per Foot, Silk,	40 Cents.
“ “ Worsted,	30 “
Discount.....per cent.	

Discount per cent.

Office Wire

IN COILS OR ON SPOOLS.

Nos. 12 to 15, B & S. Gauge,	32	cts.	per lb.
" 16 to 18, " "	33	"	"
" 19 and 20, " "	34	"	"
" 21 and 22, " "	37	"	"

Black or "American" Insulation Inside, Two Cents per Pound, Extra.

DOUBLE CONDUCTOR OFFICE
WIRE.

Two Wires in One Covering, 33 cts. per lb.

Annunciator Wire

ON POOLS.

Nos. 12 to 15,	B. & S. Gauge,	30 cts. per lb.
" 16 to 18,	" "	32 " "
" 19 and 20,	" "	33 " "
" 21 and 22,	" "	36 " "

The actual cost of the above wires is determined largely from the number of feet obtained per pound. We claim for our wire the greatest number of feet per pound, the most thorough and compact insulation, the finest finish, and greatest durability of any in the market.

Tinsel Cord

Not Insulated.....	3 Cents per yard
Braided with Worsteds.....	4 1/2 " "
Braided with Silk.....	7 1/2 " "
Braided with Linen.....	10 " "
Doolittle Patent Tips.....	\$1.50 per 100.
Patent Screw Tips.....	2.00 " "
Medical Tips.....	3.00 " "

Western Union Switch Cord and all styles of Flexible Cordage furnished to order at the lowest market prices.

APPROXIMATE WEIGHT OF
INSULATED OFFICE AND ANNUN-
CIATOR WIRES.
AMERICAN GAUGE.

Braid & Wire

No.	Ft. to lb.	No.	Ft. to lb.
4.....	8	16.....	95
6.....	12	17.....	100
8.....	20	18.....	120
12.....	35	19.....	135
13.....	45	20.....	145
14.....	55		

Double Wound Wire.

No.	Ft. to lg.	No.	Ft. to lg.
4	8	18	160
6	12	19	200
8	20	20	200

Gutta Percha Insulated Wire.

American Gauge.

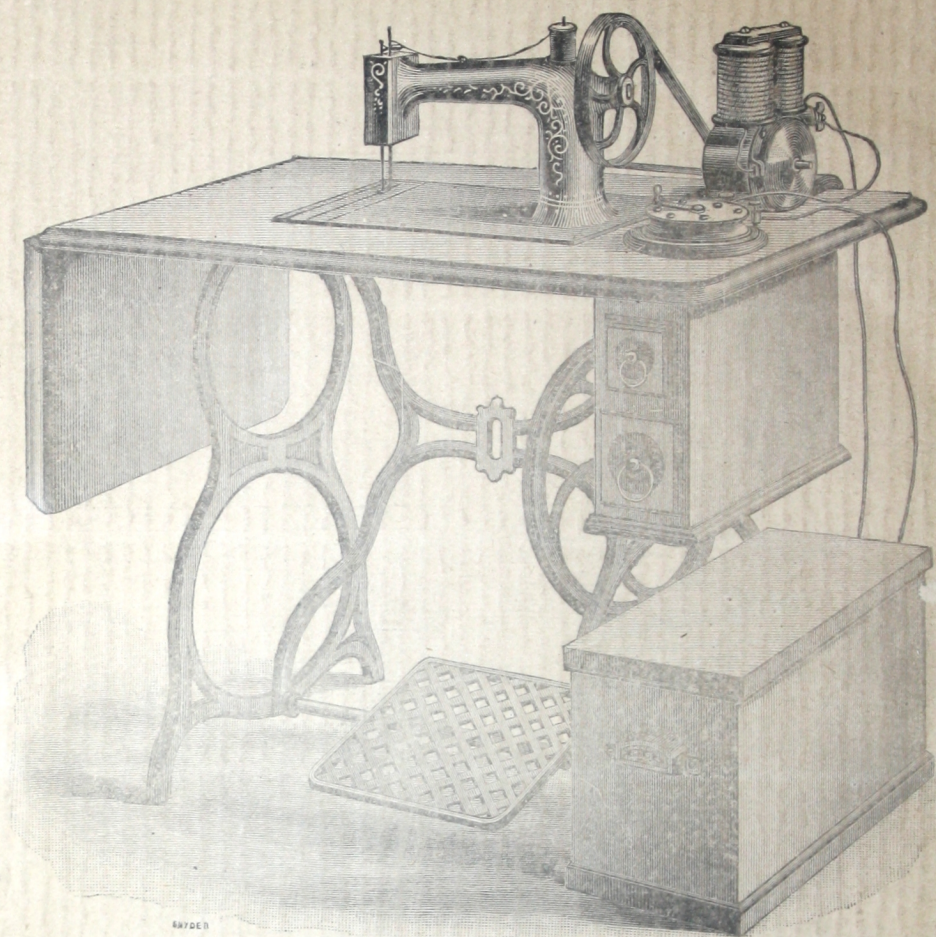
Size of Wire and Insulation.	No. Feet to lb.	Price per lb.
4 X 1	8	.90
6 X 2	11	1.10
8 X 3	16	1.10
10 X 4	21	1.20
12 X 6	36	1.30
14 X 7	51	1.40
16 X 8	75	1.55
18 X 9	126	1.70
20 X 11	176	1.90
22 X 12	230	2.10
24 X 13	330	2.30
26 X 14	480	2.55
28 X 15	586	2.90
30 X 16	950	3.65
31 X 17	1242	4.80

Kerite Insulated Copper Wire.

Birmingham Gauge.

No.	Insulation	Price per 100 ft.
18, 4-32	\$2.25
18, 5-32	2.25
18, 6-32	2.70
16, 5-32	2.70
16, 6-32	3.00
16, 7-32	3.40
14, 6-32	3.40
14, 7-32	4.05
14, 8-32	5.10
14, 9-32	5.62

Kerite Tape, per roll	95 Cents
-----------------------------	----------



PARTZ
Electric Motor Battery

— FOR —

Running Sewing Machines, Fans,
Small Lathes, Etc.